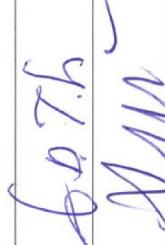


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STANDARD OPERATING PROCEDURE

CHS FIRE PROTECTION SYSTEM

MDPCL-OMH-SOP-01-007

Date Approved: 31/10/2019	Approved by Team Leader: Duong Thuc Son 
Date Approved:	Approved by Operation Manager: Sid Phan 

Revision No.	Description	Revision Date	Prepared by	1st Reviewed by	2nd Reviewed by
0	First Issue	15-Oct-2018	Nguyen Thi Phuong		
1	First revise	22-Oct-2019	Ban Trung Hung	Doan Van Lieu	Nguyen Van Tan

REVISION HISTORY

No.	Date of revision	Description of change	Reviewed by	Approved by
0				
1				



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1. PURPOSE AND SCOPE

The purpose of this document is to provide a systematic guideline to operate CHS Fire Protection System. Fire Protection system will be to provide water for the following area:

- Wet sprinkler system(Transfer tower, conveyor belt)
These water wet sprinkler fire protection systems shall be used for the following fire zones, at a nominal spray density of 10.2L/min/m². Each spray wet sprinkler system will be hydraulically designed engineered, fabricated and tested in accordance with NFPA 13.
 - Water spray system(conveyor belt)
These water deluge fire protection systems shall be used for the following fire zones, at a nominal spray density of 10.2L/min/m². Each spray deluge system will be hydraulically designed, engineered, fabricated and tested in accordance with NFPA 15.
 - Deluge system (Bag filter & vacuum cleaner)
These water deluge fire protection systems shall be used for the following fire zones, at a nominal spray density of 0.78L/min/m². Each spray deluge system will be hydraulically designed, engineered, fabricated and tested in accordance with NFPA 850.
- Fire alarm
If a fire occur, the detectors send the fire signal to fire control panel.
Fire control panel is quickly send a signal to the fire zone the fire alarm and the valve run signal. Each spray deluge system will be hydraulically designed, engineered, fabricated and tested in accordance with NFPA 72.

2. DEFINITION AND ABBREVIATIONS



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PLC	Programmable Logic Controller
I/O	Input/ Output
CV	Belt Conveyor
TT	Transfer Tower
DC	Dust Collector
NFPA	National Fire Protection Association

3. PRECAUTION

Job	Hazard	How to Eliminate Hazard
sprinkler heads, line pipe water, status of valves	Corrosion, leak water, fire	Check daily and replace emergency

4. PROCEDURE INSTRUCTIONS

ACTIVITY/ TASK	ACTION	RESPONSIBLE	REMARK
I. CHECK			
1. Daily inspection	1. Check lamps on the fire control panel. 2. Check display in the fire control panel. 3. Check power state of fire control panel. 4. Check essential devices for damage, trouble, or fault. 5. Check fixed state of the temperature heat detectors. 6. Check phone within the fire alarm main control panel. 7. Check horn/strobe state of the installed areas.	Maintenance person Maintenance person Maintenance person Maintenance person Maintenance person Maintenance person Maintenance person	
	8. Check fire detectors state of the fire control panel.	Maintenance person	
	9. Check gauge pressure of the alarm check valves and deluge valves	Maintenance person	
	10. Check fixed state of open type sprinkler head.	Maintenance person	
	11. Check solenoid valves and nozzles for damage, operability, or obstruction.	Maintenance person	
	12. Check manual call point state of the installed areas.	Maintenance person	
	13. Check accessories for damage or trouble.	Maintenance person	
2. Periodic	1. Fire control panel		



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inspection	<ul style="list-style-type: none">- Check operation of all lamps.- Check fire alarm with detection of the detector.- Check fire alarm with the manual.- Check phone within the fire control panel for the communicate to local area.	Maintenance person	
2. Fire detector	<ul style="list-style-type: none">- Check enc of line resister box- Check terminating resistance of the installed within the resister box or end of detection circuits- Check detection circuits of each other detector lines- Check detection of the installed detector in the facilities- Check fixed state of the leaner detectors	Maintenance person	
3. Piping, valves, instruments	<ul style="list-style-type: none">- Check distribution piping for damage or corrosion.- Check pipe connections for damage or corrosion.- Check state of pipe supports.- Check alarm check valves and deluge valve for damage or leakage.- Check deluge valve open with detection of the detectors.- Check operate of the PS, TS, SOL	Operator	
4. Sprinkler head	<ul style="list-style-type: none">- Check fixed state of the sprinkler heads.- Check close type sprinkler head by damage.- Check leakage of the water.	Operator	
5. Check Portable extinguishers in TT, RE, CHB and fire hose boxes		Operator	
II. WIRING CONNECT ON CHECK	<ul style="list-style-type: none">1. All of electrical wire connections between field equipment will be checked.	Maintenence	

III. OPERATION SYSTEM

1. Locate the following components associated with CHS fire protection system

a. Located in TT 01: Local fire control panel

AZ001: CV03A_Wet type valve/ close type sprinkler head

AZ002: CV01B_Water spray valve/ water spray nozzle



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AZ003: CV01A_Water spray valve/ water spray nozzle
AZ004: TT01_Wet type valve/ close type sprinkler head
AZ005: CV02B_Water spray valve/ water spray nozzle
AZ006: CV02A_Water spray valve/ water spray nozzle
AZ007: CV05B_Water spray valve/ water spray nozzle
AZ008: CV05A_Water spray valve/ water spray nozzle
AZ009: TT03_Wet type valve/ close type sprinkler head
AZ010: CV04A_Wet type valve/ close type sprinkler head

b. Located in TT_02: Local fire control panel

AZ011: CV03B_Wet type valve/ close type sprinkler head
AZ012: TT02_Wet type valve/ close type sprinkler head
AZ013: TT04_Wet type valve/ close type sprinkler head
AZ014: CV04B_Wet type valve/ close type sprinkler head
AZ015: CV05A_Water spray valve/ water spray nozzle
AZ016: CV05B_Water spray valve/ water spray nozzle

c. Located in TT_05: Local fire control panel

AZ017: Tripper Room_Wet type valve/ close type sprinkler head
AZ018: Vacum01_Deluge valve/ water spray nozzle
AZ019: CV05B_Water spray valve/ water spray nozzle
AZ020: CV05A_Water spray valve/ water spray nozzle
AZ021: DC01_Deluge valve/ water spray nozzle
AZ022: DC02_Deluge valve/ water spray nozzle
AZ023: TT05_Wet type valve/ close type sprinkler head

d. We use 4 fire protection pump for all plant in fire house by auto mode

+ Fire hose box and fire department connection are arranged in coal shed and outside around coal shed, TT and CHB: use as auxiliary connection through which the fire department can pump water to supplement existing water supplies.
+ Portable extinguishers in TT, RE, CHB.

+ Thermal detectors are arranged in TT for supervising temperature at that location
+ Manual station: use for open fire protection valve in a case emergency by pull down. They are arranged at outside door CHB. Alarm bell at TT

2. Operating system Deluge valve/ water spray nozzle

a. Setting of deluge valve

- Step 1: Check at water spray control panel that relevant solenoid valve has been de-energized
- Step 2: Set the deluge valve:



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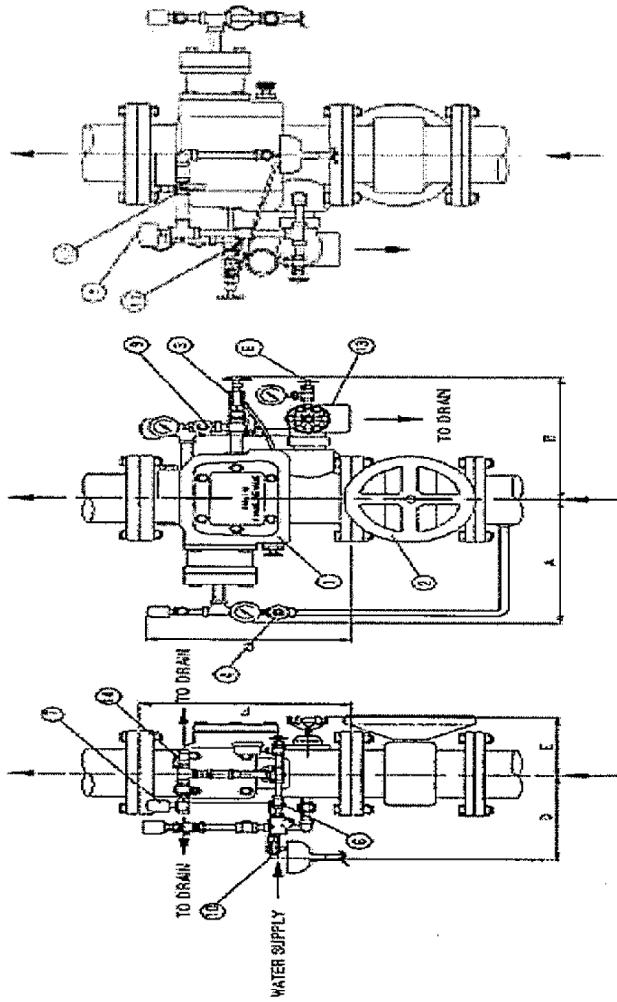
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• Part List:

NO	Part	NO	Part
1	Pre-Action Valve	8	Pressure Valve(Inlet)
2	OS & Y Valve	9	Pressure Valve(Outlet)
3	Air control Valve	10	Drip Check Valve
4	Pressure Gauge(Setting)	11	Pressure Switch Test Valve
5	Pressure Switch	12	Ball Valve
6	Actuating Unit Water Supply Valve	13	Drain Valve
7	Solenoid Valve	14	Emergency Relrase Valve

- 1) Check point before set
 - + Close the "2. OS & Y valve" and "3 air control valve"
 - + Open the "13. Drain valve"
 - + Close the "14. Emergency release valve"
 - + Open the "8", "9" pressure water gauge valve
 - + Relieve all pressure from the precaution system piping and pilot line.
- 2) Open the "6" actuating unit water supply valve
 - + At this time the "8" pressure valve water gauge rise
- 3) Open main gate valve and then slowly open the "2OS & Y valve"
 - + At this time pressure switch and Solenoid valve not work



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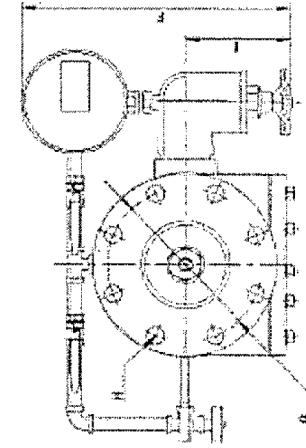
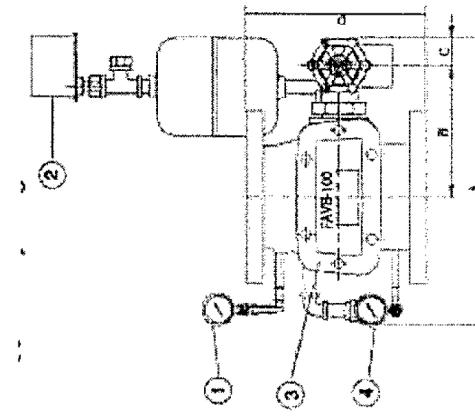
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- 4) Close the “10 Drip check valve” when filling flow of water from “10 drip check valve”,
 - + At this time, when “10 drip check valve” is opened, the water should be banned
 - 5) Close the “10 drip check valve”
 - 6) Completely open the “2.OS and Y valve”
- b. Heat detector operation
- In the event of a fire, the rise in temperature causes the heat detectors fitted in the rise area to operate allowing the solenoid valve to energize. The resultant loss of water pressure by solenoid valve allows the deluge valve to open and water to flow to the spray nozzles. When the deluge valve opens, the pressure of water flowing to the spray nozzles initiate an alarm condition in the relay room. The loss of water pressure is also indicated in the control room.
- Note: In a case: solenoid valve can not open by automatic, when we will open Emergency valve for opening Deluge valve or pull down at manual station corresponding Shut down after a fire
- c. Shut off the water supply to relevant deluge valve by close butterfly valve
 - Step 1: Shut off the water supply to relevant deluge valve by close butterfly valve
 - Step 2: Cancel the alarm at water spray control panel
 - Step 3: Shut down the fire pump
- d. Resetting after a fire
- Step 1: Open drain valve when empty water then close drain valve
 - Step 2: Remove all the spray nozzles that have been in operation thoroughly clean and refitted
 - Step 3: Check that the relevant solenoid valve has been de-energized
 - Step 4: Reset the deluge valve in accordance with setting deluge valve

2. Operating Wet type valve/ close type sprinkler head system

- a. Setting of Wet type valve

Assembly Diagram





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Part list

NO	Part
1	Pressure Gauge (Outlet)
2	Pressure Switch
3	Alarm Valve Body
4	Pressure Gauge (Inlet)

- a. Sprinkler head operation
 - Step 1: Open main gate valve
 - Step 2: Slowly open butterfly valve and check “1” and “4” (pressure of pressure gauge inlet and outlet). When pressure of two pressure gauge inlet and outlet is almost same → setup valve complete.
- b. Sprinkler head operation
 - When temperature at sprinkler head increase to 68°C, it will be broken. Water will spray outside → pressure in pipe decrease → to make Wet type valve open automatic. Pressure switch is active send signal to fire control panel → water motor alarm bell is active.
- c. Shut down after a fire
 - Step 1: Close butterfly valve
 - Step 2: Cancel the alarm at fire control panel
- d. Resetting after a fire
 - Step 3: Shut down the fire pump
 - Step 1: Close butterfly valve
 - Step 2: Open drain valve when empty water then close drain valve
 - Step 3: Remove all sprinkler head that have been in operation and change by new ones.
 - Step 4: Reset the wet sprinkler valve in accordance with setting of wet sprinkler valve.

3. Operating of Water spray valve/ water spray nozzle system

Same as Deluge valve/ water spray nozzle system. Only different control signal to open solenoid valve by liner heat detector cable. In the event of a fire, the rise in temperature to 68°C causes the liner heat detector cable will be broken to operate allowing the solenoid valve to energize. The resultant loss of water pressure by solenoid valve allows the deluge valve to open and water to flow to the spray nozzles. When the deluge valve opens, the pressure of water flowing to the spray nozzles initiate an alarm condition in the relay room. The loss of water pressure is also indicated in the control room.

4. Operating of water spray valve/ close type sprinkler head system at electric room of CHB

- a. Setting of water spray valve:



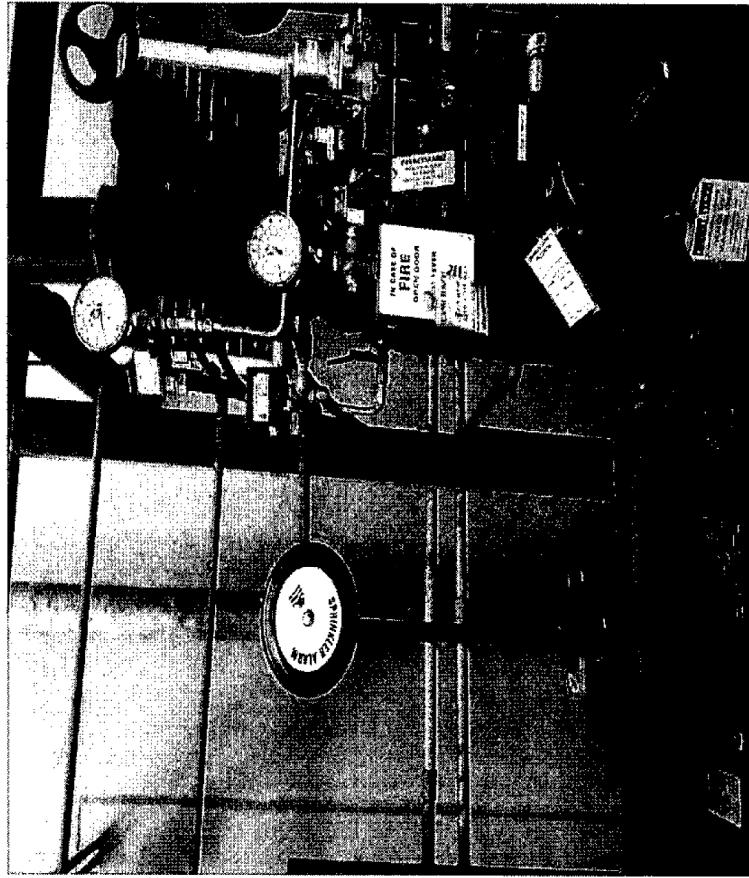
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- Step 1: Check at water spray control panel that relevant solenoid valve has been de-energized

- Step 2: Set the deluge valve:

- 1) Close OS&Y gate valve
- 2) Close air ball valve
- 3) Close water ball valve
- 4) Open drain valves → when empty water close emergency release valve.
- 5) Open emergency release valve → when empty water close emergency release valve.
- 6) Open pressure water gauges valve and pressure air gauge valve
- 7) Close butterfly valve
- 8) Close deluge valve and open water ball valve and check pressure water gauge increase to 12 bar
- 9) Slowly open OS&Y valve and check pressure water gauge increase to 12 bar
- 10) Open butterfly valve
- 11) Open air ball valve and check pressure air gauge increase ≥2 bar ok

b. Sprinkler head and smoke operation

Sure safety for electric room: this system only operate when at the same time have together two signal are active: smoke detector and sprinkler head. When temperature increase to 68°C → sprinkler head will be broken → air pressure in outlet line decrease: when pressure switch is active send signal to fire control panel. And at the same time



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smoke detector is active and send signal to fire control panel → It quickly send signal to open solenoid valve → open deluge valve → water to flow to sprinkler head → Water motor alarm bell is active.

Note: In a case solenoid valve can not open by automatic, when we will open Emergency valve for opening Deluge valve or pull down at manual station corresponding

- c. Shut down after a fire
 - Step 1: Close OS&Y valve
 - Step 2: Cancel the alarm at fire control panel
 - Step 3: Shut down the fire pump
- d. Resetting after a fire
 - Step 1: Open drain valve when empty water then close drain valve
 - Step 2: Remove all sprinkler head that have been in operation and change by new ones.
 - Step 3: Check that the relevant solenoid valve has been de-energized
 - Step 4: Reset the water spray valve in accordance with setting water spray valve

Prepared by:

Approved by: